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Postat: A Cross-Platform, RSS-Based Advertising and Event Notification System for Educational Institutions

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Abstract

The online advertising techniques, such as emails and display advertising, offer a wide range of benefits to the business community. Recently, these techniques were extended to include social media and interactive ads to reach the target customers precisely. However, using these techniques in a local community such as universities, colleges and schools become a reliable announcement and notification systems. In this paper, we introduce our notification system Post@ (pronounced "postat"). Post@ is a RSS-based web service that automatically delivers announcements, posted by a publisher, to subscribers' PCs or smartphones directly. Post@ updates can be easily accessed through any RSS reader (desktop gadgets, dashboard widgets, or mobile apps) that is connected to the private or public channels of our system. Post@ was implemented and tested on many operating systems and devices within our university and the evaluation results showed an excellent subscribers' satisfaction.

Keywords: RSS Feeds; Mobile Apps; Web Advertising; Web Publishing; Internet Marketing; XML; Event Notification System;

1. Introduction

The need for fast, free, and reliable advertising channels is increasing as more educational institutions are using the latest electronic communication devices. These devices require a modern advertising tools and event notification systems which deliver the messages to the staff and students as fast as possible in order to make them satisfied about the institution. A registration process should be initiated by the subscriber (Student, staff, etc.) to the notification channel in order to receive the publisher notifications. For example, in any university messaging system, the subscriber has to get login information in order to send or receive message from the university administration or the publisher such as our Applied Science University (ASU) - Online System.

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There are many popular notification systems and protocols that provide global services, such as the Netnews distribution system [1], Herald [2], Gnutella [3, 4], Farsite [5], and all of them make use of the huge success of the World Wide Web (WWW) and the Internet. A General Event Notification Architecture (GENA) has been proposed by Cohen et al. [6, 7]. GENA provides a transmission service system that enables HTTP resources to send or receive notifications such as the distribution lists. Most of the popular event notification systems support many output format types. For example, the SWREG system [8] delivers plain text, XML, and JSON using delivery methods such as emails or HTTP POST to a specified URL.

Most of the educational institutions, especially for primary and secondary education, share their important news with students using their official websites or via the typical advertisements boards located on their premises. However, such archaic approaches are not effective as information may not reach the concerned buddies and the tent of the students to spend more time using electronic devices than staying in the schools reading ads. However, in higher educational institutions such as colleges or universities, it is common to distribute news using mailing lists or private messaging systems. But due to the cross functionality of the various schools in a university, it is hard to find a free, instant, and reliable notification service that delivers the information where and when needed. In addition to the fact that, any electronic system needs frequent login process in order to get in that system.

In this work, we proposed the solution, Post@, that offers an effective notification channel, reaching all students in any educational institution via desktop, web browser, and mobile applications without even any login information. Post@ implements the Really Simple Syndication (RSS) web format which is based on a standardized XML file format [9].

The remainder of this paper is organized as follows: The problem statement is analysed in Section 2. Section 3 describes the design of the Computer Platform system for Post@. The practical implementation of the system and the evaluation results is discussed in Section 4. Conclusions and recommendations for future work are presented in Section 5.

2. Problem Analysis

In order to find the best method of distributing the ads in any educational institute, we have conducted a survey over 1000 university students, around 100 of them from the Faculty of Information Technology (FIT) highlighting three main points: (1) The regular electronic methods to publish and read announcements (2) Students' satisfaction with the current methods and (3) The preferred technology to get the announcements. The survey has also been directed to administration people in the university since they are the publisher of the most announcements. The collected results were reflecting the following subsections.

Related to the regular electronic methods, Most of the administration people preferred the advertisements boards of the university website, the website pages, or using the university messaging system that we have mentioned earlier the "ASU-online" service. They have published their important announcements via these regular methods mainly because they used to use them and they are stuffed of duties so they are not bothered to learn a better way. However, the students via these methods have to pass by all the advertisements boards, or login to their ASU-online pages in order to get the important announcement. For a year now even though the administration people were not optimistic for a new method, they have to create a group in the widely used social media websites such as Facebook, and Twitter, in order to distribute the important announcement over the largest number of students in a short time.

The results of the most method used either for publisher to distribute the messages or for students to read them according to the survey results, depicted in Fig. 1, came as the following. The messaging system (ASU-online) achieved the best results (around 44%) regarding what the publisher really used for distributing announcements. Because such a system is trusted source of information and allows subscribers to respond back to the publisher via the login process. The social media websites came second (around 36%) because of their widely used. Then the university website and its advertisements board achieved the lowest (around 12% and 8% respectively), which

is not supervising because of the limited number of students check that or the late checking after the announcements beneficiary time.

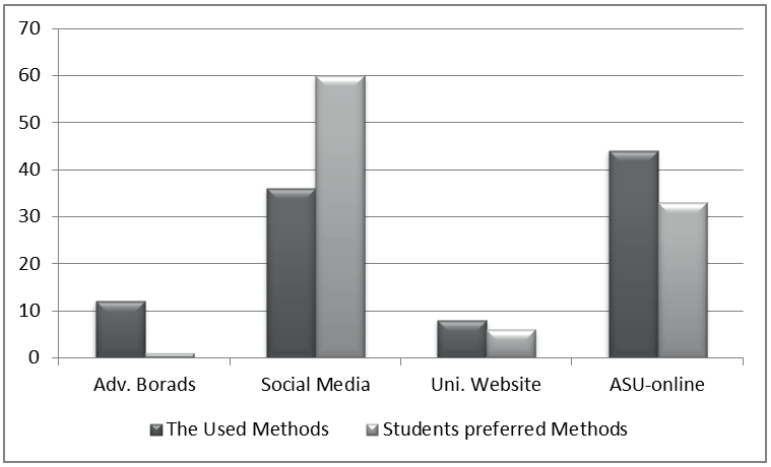

Fig. 1 Survey results of the available methods to read announcements

While the survey results, related to the students' preferred ways of having the announcements, came as the following. In a way to clearly understand the problem, we changed the question and asked students about what they prefer, not what they frequently use. This time, 60% of them prefer to use social media website such as Facebook to be the main reference for tracking the university announcements, while 33% of them preferred to use the ASU-online system, 6% of the students voted for the university website, and only 1% of the students liked the advertisements boards of the website.

Without mentioning any specific notification service, we asked the students about the efficiency of the current used announcement methods and their satisfaction about them and the results were as shown in Table 1.

Table 1 Students Satisfaction of the current methods

Students Satisfaction	Fair	Good	Excellent
Students Percentage	33%	67%	0

Therefore, none of the students were very happy with the current methods and gave excellent. The main factor, which we have found in our survey, was how fast they can get the announcements. Asking about reading an advert within 24 hours after publication, only 40% of the students were updated while 60% stated that they are used to get late announcements.

In order to know the best platform to implement our suggested event system, we have done a separate survey related to the best technology and platform available. Because of the wide use of smart phones among students, about half of the study sample prefers to get notifications via a mobile application. As shown in Fig. 2, 24% of the students are used to check for updates by browsing specific pages on the university website and they prefer to have a specialized website for announcements. On the other hand, 16% are interested in a Web application that keeps a record of subscriber's personal preferences for specific channels of news feeds. Only 8% of the students are interested in getting notifications direct to their personal computers using desktop application. And a few others suggested the use of other methods such as SMS and mailing lists.

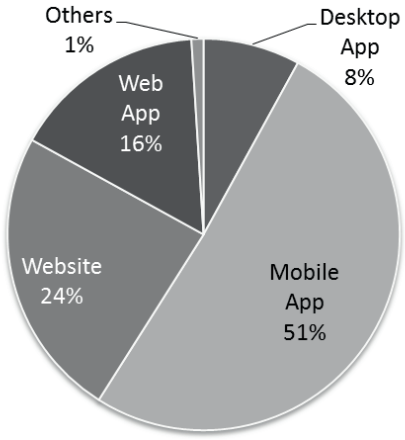

Fig. 2 The preferred technology to get announcements

After analysing the survey results, we found that problems of the current systems revolve around reaching followers on time, in addition to the feeling of not being updated with the announcements, other than there is no official and reliable source of information that they can refer to. Furthermore, none of the users think that the current system efficiency is excellent. Therefore, the solution was to design a live, fast and multi-platforms event system, which is Post@.

3. The Computer Platform Design for Post@

The Post@ system has the following specifications in order to cover all the view points of the survey results that have discussed in the previous section:

- A Cross-Platform application that can operate on portable and desktop computers and mobile devices.
- Subscribers (students) have to receive announcements within few seconds after posting and even without long process such as web browsing or login system.
- Subscribers should have many announcement channels, categories and domains to choose from.
- Publishers (administrators or faculty members) can post announcements within their domains or channels only.
- The appearance of the announcement should be in any location the subscribers frequently use without the need of creating accounts for each subscriber.

As shown in Fig. 3, Post@ has an administrator as any other system. This administrator is responsible about managing the publisher profiles and creating the categories domains.

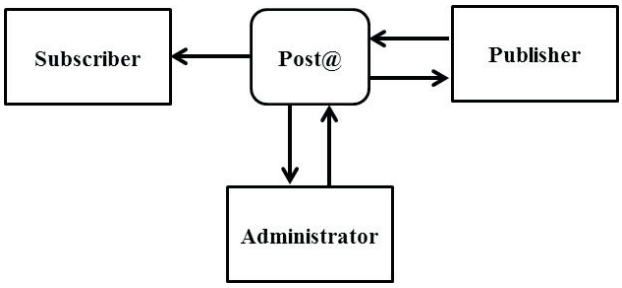

Fig. 3 The Post@ system context diagram

The publisher in the Post@ system can add a post via a simple web page in the web application that is associated with the system database. The data are inserted via these web pages into the database as shown in Fig. 4. An ASP .NET platform was developed to automatically create a RSS feed using the XmlWriter class. RSS is used because of its simplicity for implementation and subscription. In addition, it is reported that a significant save of 93% of the network bandwidth can be achieved by the use of RSS clients as they fetch the updates instead of the entire feed, which considered as a high speed communication protocol [10].

Fig. 4 Diagram of the Post@ system

Post@ guarantees the use of multi-platforms as shown in Fig. 4, Post@ updates can be accessed through:

- Personal Computers: Windows Desktop Gadgets, Mac Dashboard Widgets, Microsoft Outlook, and Internet Browsers.
- Smartphones: Any free RSS reader that is compatible with iOS, Android, Symbian, or Windows Mobile.
- Cell Phones: Any free RSS reader that is based on Java 2 Micro Edition (J2ME) / Mobile Information Device Profile (MIDP).
- Internet Devices: Any device that can access the website that is associated with Post@.

4. Practical Implementation and Discussion

In order to evaluate our system, a channel was created for the computer science department at ASU. Then, a customised desktop gadget was developed, as shown in Fig. 5, to automatically fetch updates from the Post@ server. The gadget was installed on 50 desktop PCs within the labs of FIT at ASU. In addition, students were invited to install the free RSS readers on their own PCs and smartphones and a link to Post@ feeds was announced. An example of a free RSS reader for iPhone is shown in Fig. 6.

Fig. 5 The personalized Post@ desktop gadget

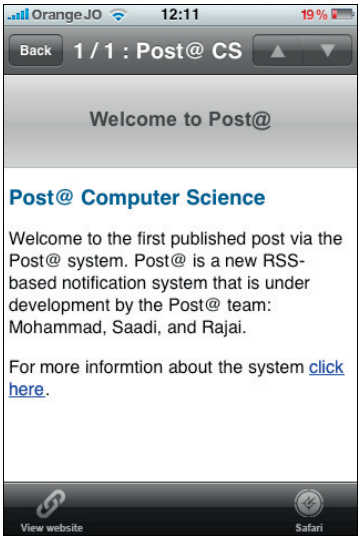

Fig. 6 Post@ via a free RSS reader for iPhone

We published a test announcement as shown in Fig. 5 and Fig. 6 using the created channel and a counter was calculating the number of visits for the announcement page during a full day. At the end of the day, we got the results depicted in Fig. 7.

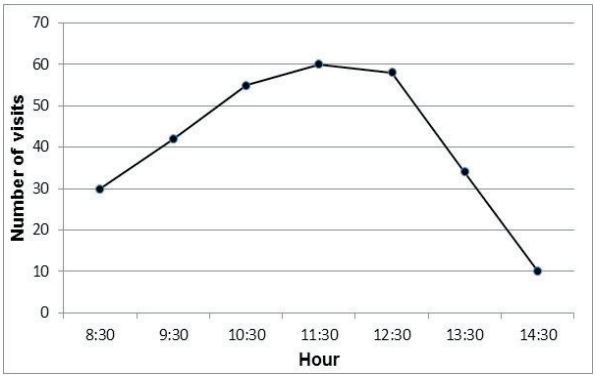

Fig. 7 Visitors for a single announcement via Post@

In general, there has been an increase in the number of users for Post@ with time and as shown in Fig. 7 it hits its maximum during the period 11:00 to 12:00. The reason for this is that students started to inform each other about the service. In addition, the number of smartphone subscribers increased as students became familiar with Post@.

As it is impossible to catch all smartphone subscribers, we conducted a short survey for 100 students of the lab visitors to find out if the Post@ gadget is usable or not. The survey included the questions listed in Table 2.

Table 2 Questions of the gadget short survey

Question	Yes
Do you use the university's PCs daily?	84%
Did you miss an event because of a late notification?	34%
Have you ever read an announcement within 24 hours of its publishing time?	50%
Did you see the Post@ Gadget on the Desktop?	92%
Did you read the gadget headlines?	80%
Are you going to install this gadget on your personal computer?	86%
Do you think that Post@ is a reliable service?	90%

From the gadget survey results of Table 2 we found that 84% of the students are visiting the labs daily and 80% of them read the published headlines which means that they will be updated with the university announcements even if they didn't access Post@ via their personal computers or smartphones. Furthermore, Post@ will solve the problem of late notifications for 50% of the students and 34% of them will not miss an event anymore.

For more accurate statistics, we carried out a study for the course schedules of 40 students within FIT who are registered for the summer term 2012. In the study, we were looking for three parameters:

- The average number of lab sessions per day per student.
- The average of the total time that students spend in labs as a percentage of the hours spent in the university.
- The average coverage time: This is the average of the total time (in hours) from the beginning of the first lab session to the end of the last lab session for the same student.

The statistics of Table 3 prove that every student at FIT will be visiting a computer lab at least once a day, spending about one quarter of the day working on a PC, and will be covered by the university announcements for a good period of time.

Table 3 Course schedule statistics

Parameter	Result
The average number of daily visits to labs	1.325
The average time spent in labs daily	24.5%
The average coverage time	2.631

5. Conclusions and Future Research

In this paper, we proposed a simple event notification system that provides reliable announcements channels to all students in an educational institution. The proposed solution provides mobility which is one of the most important requirements by such systems, as well as cross platforms system that can be access from smart phone,

PCs, or laptops. As a RSS-based system, Post@ enables its subscribers to use a short link over any device that can reads RSS feeds.

Post@ provides a free, user friendly, and instant service for publishers and subscribers. Each publisher has access to his own domain or channel and each subscriber can connect to his domain of interest.

Initial implementation of the system showed an excellent subscribers' satisfaction in addition to the following savings and features:

- Time saving: For both the publisher and the subscriber.
- Paper saving: No need for printed announcements anymore.
- Simplicity: Post@ is an easy to use system were no login is needed for subscribers.
- Easy installation: The wide range of devices that can read RSS feeds.
- A pretty replacement for the traditional advertisements boards. These boards can be replaced by an LCD screen that shows the feeds page.

In the near future, we will be working on Post@ to include the following:

- Publishers can add a post using a short message (SMS) or via a mobile application.
- The Post@ gadget will enable the subscriber to select the preferred channels via the gadget.
- Creating private channels where the feed links are encrypted and only accessible by specific subscribers.
- Integrating the service with social networks such as Facebook.

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References

[1] B. Kantor and P. Lapsley, "Network News Transfer Protocol: A Proposed Standard for Stream-Based Transmission of News," Accessed Jul. 2012: RFC 3977, Available http://tools.ietf.org/pdf/rfc3977.pdf, October 2006.

[2] L. F. Cabrera, M. B. Jones, and M. Theimer, "Herald: Achieving a Global Event Notification Service," in Proceedings of the Eighth Workshop on Hot Topics in Operating Systems: IEEE Computer Society, 2001.

[3] Clip2-DSS, "Gnutella: To the Bandwidth Barrier and Beyond," Accessed Jul. 2012: Available http://www.cs.washington.edu/homes/arvind/cs425/doc/gnutella.html, 2000.

[4] R. Massey, S. Bharath, and A. Jain, "Gnutella-Pro: What bandwidth barrier?," Accessed Jul. 2012: Available http://cseweb.ucsd.edu/classes/wi01/cse222/projects/reports/gnutellapro-5.pdf.

[5] B. Bolosky, J. Douceur, D. Ely, and M. Theimer, "Evaluation of Desktop PCs as Candidates for a Serverless Distributed File System," in Proceedings of ACM SIGMETRICS 2000, Santa Clara, CA, 2000, pp. 34-43.

[6] J. Cohen and S. Aggarwal, "General Event Notification Architecture Base," Accessed Jul. 2012: Available http://tools.ietf.org/pdf/draft-cohen-gena-p-base-01.pdf, July 1998.

[7] J. Cohen, S. Aggarwal, and Y. Y. Goland, "General Event Notification Architecture Base: Client to Arbiter," Accessed Jul. 2012: Available http://tools.ietf.org/pdf/draft-cohen-gena-client-00.pdf, June 1999.

[8] DR-MyCommerce, "SWREG Event Notification System," Accessed Jul. 2012: Available: http://www.swreg.org/ens.htm, 2012.

[9] RSS-Advisory-Board, "RSS 2.0 Specification," Accessed Jul. 2012: Available: http://www.rssboard.org/rss-specification, 2009.

[10] H. Liu, V. Ramasubramanian, and E. G. Sirer, "Client Behavior and Feed Characteristics of RSS, A Publish-Subscribe System for Web Micronews," in Proceedings of the 5th ACM SIGCOMM conference on Internet Measurement Berkeley, CA: USENIX Association, 2005.